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SOCK PEGFIELD OF INVENTION

This invention relates to a garment clamp for clamping pairs of garments, such as socks, tights or stockings together for storage or washing, drying or other processing.

5 BACKGROUND ART

The following description of the prior art is not intended to be, nor should it be interpreted as, an indication of the common general knowledge.

A perennial and universal problem is the separation of members of pairs of garments during washing, drying and the like. Attempts to address this problem by providing a  
10 suitable clamping device have been described.

In US 5,671,876 (Gardiner) a sock organiser in the form of a tong-like moulded plastic clamp is described. The device described has a pair of gripping members connected by an integral hinge. The device is adapted for keeping together a plurality of pairs of garments and the difficulty in utilising this device lies in the struggle to align multiple pairs  
15 of garments in place prior to clamping the device together.

US 5,944,236 (Cinque) describes a two-part device having hingeably connected jaws which may be locked in the clamping position by the application of a separate securing member. The described clamp cannot be made in one piece and operators would be likely to experience difficulty in manipulating the part components to successfully secure a pair of  
20 garments.

In US 5,357,660 (Smith) there is described a two-part tab bearing a numerical or other indicia to be attached to each member of a pair of garments to enable the socks to be matched according to the indicia. It can be seen that this system still permits the separation

of members of pairs of garments and still requires sorting and recombining of the members of pairs subsequent to processing such as washing.

In US 5,3234,139 (Korenstein) there is described a clamp for clamping together pairs of paired garments such as socks and other textile articles. The hook, described as optional, 5 is not fully adapted to securely engage a thin diameter clothes line and conceivably may be dislodged in moderate to strong winds. Moreover, force is required to urge the opposed arms of the clamp 12, 14 for a positive engagement with the locking means 34, 36. Accordingly, failure of the locking means 34, 36 will result in the failure of the clamp to clamp the garment articles.

10 It is an object of the present invention to overcome one or more of the abovementioned disadvantages of the prior art or to at least provide a useful alternative thereto.

#### **STATEMENT OF INVENTION**

Accordingly, the present invention provides an integrally formed clamp including:

15 an opposed pair of first and second elongate substantially rigid members, the first elongate member having a first handle portion and a first clamp portion and the second elongate member having a second handle portion and a second clamping portion;

a flexible joint intermediate the lengths of the first and second elongate members configured to urge the first and second clamping portions into abutment; and

20 locking device,

wherein the locking device has a first end hinged to the first handle portion and rotatable about the hinge and a second free end adapted to releasably cooperate with the second handle portion whereby to lock the first and second handle portions in spaced relationship and the first and second clamping portions in abutting relationship.

The clamp is suitable for keeping members of a pair of garments together during laundry processing, wherein:

in the passive state the first and second clamping portions are urged into abutment and the first and second handle portions are held in spaced relationship by the flexible joint;

5 upon compression of the first and second handle portions, the first and second clamping portions are forced apart such that the first and second clamping portions are adapted to receive the pair of garments and to clamp together the garments when the first and second handle portions are released; and

the abutting clamping portions secure the garments against dislodgment from the  
10 clamp during processing.

The clamp may be made from a variety of materials suitable for the purpose. For example, the clamp may be made from moulded plastic material. Depending on the type of process to which the garments are to be subjected, the clamp material should be suitable for the particular application. For example, where the clamp is to be used to clamp pairs of  
15 garments during washing cycles involving hot water and detergents, the material will of necessity be heat resistant and chemically resistant sufficiently resistant to detergents to avoid chemical degradation during the washing cycle. It is preferred that the clamp material be made from polypropylene or similar plastics materials.

The clamp is preferably comprised of a unitary structure integrally formed by, for  
20 example, moulding. Preferably, the moulding process is carried out using an injection moulding process. As the clamp is preferably integrally formed whereby each of its components comprise the same material, the properties of flexibility and rigidity are generally achieved by the shape or configuration of the various components as determined by the die during the moulding process. For example, the elongate members may be

reinforced against flexible bending by ribs and other reinforcing structures. The elongate members may be bow shaped. The elongate members may include reinforcing ribs on their respective concave sides whereby to resist further bowing. The length of cure, temperature conditions, etc are moulding conditions which can be used to modify the clamp's properties.

5 Accordingly, the joint portion may be selectively heat treated or physically weakened by, for example, applying a notch to the joint surface, to weaken the joint and permit greater flexibility subsequent to the moulding process.

Preferably, the clamp does not include metal components and all components of the clamp are made from non-penetrating materials, both in terms of material hardness,  
10 consistency and shape, whereby to avoid garment damage associated with penetration and tearing.

The first and second clamping portions may include on their respective inner opposed surfaces, gripping features, such as staggered or mutually co-operating ribbed, ripple or undulating surface features. Alternatively, the clamping portion may include opposed  
15 internal tooth features. The features may be directly opposed rather than arranged in mating relationship. The opposed internal surface features may be similar to traditional clothes peg gripping surfaces or may be sawtoothed to provide a strong friction grip. In all cases, however, the internal opposed surface features of the clamping portions should be sufficiently non-penetrative to avoid tearing or damage to the garments during the washing  
20 cycle or other treatment process.

The joint is preferably sprung whereby a low loading is all that is required to compress the first and second handles towards one another whereby to achieve a spacing of the clamping portions relative to one another. Where the spring loading of the flexible joint is low and insufficient in its own right to secure the garments, the locking device prevents

the first and second handle portions from being compressed towards one another. The locking device forcibly spaces the handle portions apart whereby to achieve in the first and second clamping portions a strong clamping action.

The locking device may be in the form of a bridge flexibly attached to one of the first  
5 and second handles and releasably engageable to the other of the first and second handle portions. Alternatively, the locking device may be in the form of a wedge or other bracing element integrally formed with one or other of the first and second handles and adapted to be inserted therebetween in a frictional or positively engaging bracing relationship whereby to prevent the first and second handle portions from being displaced towards one another.

10 The bridge may include a cam surface adapted to ride over a protrusion on the other of the first and second handle portions and to further include a recess adapted to positively engage the protrusion. Of course, the person skilled in the art will appreciate that the protrusion may be on the bridge and the cam surface and recess may be on the other of the first and second handle portions.

15 To enable the clamp of the invention to be utilised as a clothes peg, the clamp may further include a clothes line attachment means integrally formed on the external surface of one of the first and second elongate members. The clothes line attachment means may include a hook or clip. Preferably the hook is sufficiently sprung to permit resilient deformation whereby to admit the clothes line into a hook recess defined by the hook.  
20 Preferably, the hook recess is sufficiently spatially tight to resist relative movement of the clamp relative to the clothes line whereby to resist displacement in moderate or high wind conditions.

The clamp may include indicia on one or more of its components to indicate ownership (such as in the case of a particular hotel) or the nature of the garments to which

the clamp is to be attached. The indicia may be alpha and/or numeric or include some other symbol types or systems such as braille.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

The invention will now be described with reference to the following non-limiting  
5 examples in which:

Figure 1 is a perspective view of a sock peg according to one embodiment of the first invention;

Figure 2 is a reverse perspective view of the embodiment shown in Figure 1;

Figure 3 is a side view of a bridge included in the first embodiment;

10 Figure 4 is a part view of the bridge shown in Figure 10;

Figure 5 is a side view of a hinge connecting the bridge of Figure 10 to an extension of the first embodiment; and

Figure 6 is a side view of a detent included in the first embodiment.

Figure 7 is a side view of a sock peg according to a second embodiment; and

15 Figure 8 is an upper perspective view of the sock peg according to a second embodiment.

Referring to Figures 1 and 2, there is shown a sock peg 1 having a clamping portion 10, a handle portion 20, a flexible joint 30, a hook 40 and a hingedly connected bridge portion 50.

20 The clamping portion 10 and handle portion 20 comprise a pair of opposed first and second elongate members 60, 70. Each of the first and second elongate members 60, 70 is marginally bow shaped, whereby the sections of the elongate members 60, 70 corresponding to the clamping portion 10 are predominantly parallel, whereas the sections corresponding to the handle portion 20 diverge from the flexible joint 30 to their respective first and second

terminal ends 61, 71. In the section of the elongate members corresponding to the clamping portion 10, the internal facing surfaces thereof 62, 72 include facing or complementary arranged teeth. Preferably the opposing teeth 73 are not staggered, but face each other. The teeth 73 are configured to frictionally grip a pair of garments (not shown) such as a pair of socks. On the external surfaces of the elongate members 60, 70 are a series of longitudinal and transverse ribs to provide reinforcement and added rigidity to the elongate members 60, 70. The longitudinal ribs 74 extend from a point intermediate the length of the clamping portion 10 section of the elongate members 60, 70 down to their terminating ends 65, 75. Along the remainder of the lengths of the elongate members 60, 70 are spaced transverse ribs 10 76.

The arched configuration of the flexible joint 30 ensures that the elongate members 60, 70 are urged into a clamping position when the sock peg 1 is in the passive state.

Close to the first terminal end 61 is an extension 41 from which extends the bridge 50. The bridge 50 is connected to the extension 41 by means of a narrow hinge 42. 15 Immediately adjacent the hinge 42 is an expanded portion 51 at one end of the bridge 50. When the bridge 50 is flipped over 180° and lockably engaged to the second terminal end 71, the expanded portion 51 rests on top of the extension 41. The first terminal end 61 includes a recess 43 which is adapted to receive a narrow portion 52 extending from the expanded portion 51.

20 The bridge 50 further includes a brace portion 53 adapted to extend between the gap separating the first and second terminal ends 61, 71. A first end 54 includes an abutting surface is adapted to abut against the internal surface 44 near the first terminal end 61. The bracing portion 53 extends to a catch 55. The catch includes a cam or ramp surface 56 adapted to ride over a detent 77 located near the second terminal end 71 and to be pressed.

into engagement with the detent 77. The second terminal end 71 includes a guide 78 which stands proud at the top of the second terminal end 71 and is adapted to be received within a slot 57 at the free end of the bridge 50. Accordingly, the bridge 50 may be positively engaged with the first and second terminal ends 61, 71 whereby to lock the handle portion 20 against compressive forces which would otherwise be operative to open the clamp portion 10 and to release any garments secured therein.

Accordingly, the sock peg 1 is effective to secure a pair of garments in the clamp portion 10 for the duration of the processing of the garments, such as in a clothes washing cycle and drying process. To assist in drying the garments, advantageously the sock peg 1 includes the hook portion 40 depending from the extension 41. The hook portion 40 is configured for marginal deformability whereby to flex away from the first elongate member 60 to enable a wire, such as clothes wire, to be inserted into the space defined by the hook portion 40 and the first elongate member 60. The hook portion 40 at its free end 45 is slightly outwardly bent to more easily admit wire into the space 46. The space 46 is wedge shaped whereby it is widest at the extension 41 end.

In Figures 3 through to 6 the sock peg of the first embodiment is shown in greater detail. It can be seen that the sock peg 1 is capable of being injection moulded in one piece using identical polymeric material for all components. This method of manufacture is advantageous in terms of cost of simplicity of supply of materials and manufacturing efficiency. The first embodiment shown in Figures 1 and 6 is integrally formed by injection moulding.

Turning to Figure 7, there is shown a sock peg 100 according to a second embodiment. The sock peg 100 includes a pair of first and second opposed substantially parallel elongate members 101, 102 joined intermediate their respective lengths by a flexible



arch forming a joint 103. The first and second elongate members 101, 102 include a pair of opposed first and second handle portions 104, 105 at an upper end and a pair of opposed first and second clamping portions 106, 107 at a lower end. Attached to the terminal end of the first handle portion 104 is a clip 108 having a flexible arm 109 defining a hook recess 110  
5 which is adapted to receive a clothes line. The clip 108 can engage with a clothes line by forcing the clothes line through the entrance 111 of the recess 110, over a detent 112 located on the inside surface of the flexible arm 109 whereby the clothes line comes to rest securely in the crook of the recess 110. The clamp 100 is thereby resistant to minor removal forces such as wind gusts by the operation of the detent 112 and the resilient nature of the flexible  
10 arm 109.

A locking device is hingedly attached to the clip 108 by a thin flat flexible portion of material forming a hinge 120. The locking device 130 is adapted to rotate about the hinge 120 whereby the terminal end 131 of the locking device 130 is adapted to lockably engage with the upper free end 113 of the second handle portion 105.

15 The underside of the locking device 130 includes a cam surface 132 adapted to ride over a protrusion 114 at the free end 113. The cam surface 132 terminates in a shoulder 133 which, together with the underside of the locking device 130, defines a locking recess 133 into which the protrusion 114 is adapted to rest when the locking device 130 is in the locking position.

20 The free end 113 includes an upstanding knob 115 extending normal to a platform 116. The platform 116 lies in a plane generally transverse to the longitudinal axis of the second elongate member 102. Corresponding to the knob 115 the terminal end 131 includes a slot 134 (most clearly seen in Figure 9) which is adapted to cooperate with the knob 115.

A lower planar surface 135 adjacent the locking recess 133 is adapted to abut the platform 116 when the locking device 130 is in the locked position.

The cam surface 132 tapers linearly towards the hinge 120 in the form of a ramp or resting surface 136. In the locked position, the resting surface 136 is adapted to abut a support surface 117 located on the inside of the first handle portion 104.

Protrusions 137 or other surface features such as ridges, grooves, bumps or a roughened surface are provided on the surface of the locking device 130. The protrusions 137 enable an operator to grip the locking device 130 to enable the bridge or locking device 130 to be flipped open to release the socks clasped between clamping portions 106, 107.

As clearly seen in Figures 8 and 9, each of the first and second elongate members 101, 102 includes an elongate reinforcing ridge 140, 141 which each extends substantially the length of the respective first and second elongate members 101, 102. The ridges 140, 141 improve the rigidity of the elongate members 101, 102 so that substantial flexing occurs only in the upper sections of the first and second handle portions 104, 105, due to the tapering of the ridges 140, 141 in the vicinity of those upper sections.

The opposed internal surfaces 142, 143 of the first and second clamping portions 106, 107 include complimentary sets of staggered teeth 144 which are adapted to grip the garments in use.

When used in this specification and claims, the terms "comprises" and "comprising" and variations thereof mean that the specified features, steps or integers are included. The terms are not to be interpreted to exclude the presence of other features, steps or components.

It will be appreciated by those skilled in the art that many modifications and variations may be made to the embodiment described herein without departing from the spirit and scope of the invention.

5      Orientational terms used in the specification and claims such as top, bottom, upper and lower are to be interpreted as relational and are based on the premise that the peg will usually be considered with the locking device 130 upper most.

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